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**"PATENT"**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of  
Angela J. Keency, et al.  
U. S. Serial No. 10/678,468  
Filed: October 3, 2003

Before the Examiner  
Ellen M. McAvoy

Confirmation Number: 3346  
Group Art Unit: 1764

Family Number: P2002J112 US2

# HIGH VISCOSITY INDEX WIDE-TEMPERATURE FUNCTIONAL FLUID COMPOSITIONS AND METHODS FOR THEIR MAKING AND USE

**State of New Jersey**           )  
  ) ss.  
**County of Gloucester**         )

Before me, the undersigned authority, personally appeared Eugenio Sanchez, who, being by me duly sworn, deposed as follows:

1. I, Eugenio Sanchez, possess expertise in the field of Chemistry specializing in lubricating oils.
2. I attained the degree of "*Licenciatura de Quimica*" (Bachelor of Science in Chemistry) from the Universidad Simon Bolivar (Caracas, Venezuela) in 1977 and the degree of Doctor of Philosophy in Chemistry from the University of Washington (Seattle, WA) in 1987.
3. I was employed by Mobil Research and Development Company (a Division of Mobil Oil) from 1989 - 1996 doing Spectroscopy and Chemometrics research, at the Paulsboro Technical Center. I then transferred to the lubricant products division for Mobil Research and Technology Company, and worked in lubricant base stock and finished product performance. I have worked for ExxonMobil Research and Engineering since 1999, at the Products Research & Technology Department. During that period I lead technical efforts to acquire quantitative knowledge of Base Stocks and lubricant properties, and lead the technical informatics aspects of high throughput experimentation. I have worked at the ExxonMobil facility in Paulsboro, New Jersey until now.
4. I worked with lubricant additives, lubricant base stocks, lubricant synthetic base stocks, finished lubricants and fuels and fuel components. I am in particular an expert in lubricant base stock property characterization, modeling, and prediction. I have in particular studied the properties of hydroprocessed base oils in detail, and led the Products hydroprocessed base oil quality research team in 1998-1999. I am also an

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expert in chemometrics, and lubricant formulation research using high throughput experimentation..

5. During my professional career with ExxonMobil, I was an inventor or co-inventor of two U.S. Patents dealing primarily with Petroleum Products and the development, formulation and use of lubricant and fuel products.
6. This affidavit is in regards to U. S. Patent Application No. 10/678,468 (the "Application").
7. In regards to the Application, I disclose the following information regarding the Application.
8. The closest art the examiner cites is example 1 from U.S. Patent No. 6,475,960 ("Berlowitz") which are solvent dewaxed lubricants.
9. The claims in the Application is limited to a base stock with a ratio of measured-to-theoretical low-temperature viscosity less than 1.2 at a temperature of about -30°C or lower. In one embodiment, and in the dependant claims this is accomplished through hydrodewaxing.
10. Lubricants produced through solvent dewaxing and hydrodewaxing provide different properties.
11. Table 1 is a chart of a comparative test of Group 3 base stocks. Base Stock A is a hydrodewaxed base stock and Base stock B is a solvent base stock. As can be seen in table 1 both base stock A and base stock B were blended to have a nearly identical viscosity. While both base stocks have nearly identical CCS at -20°C the CSS at -30°C and -35°C differ dramatically. This data shows that a similar CCS value at -20°C cannot be extrapolated to -30°C. In addition, the solvent dewaxed comparative sample that matches the disclosure in Berlowitz would have a ratio of measured-to-theoretical low-temperature viscosity of greater than 1.2 at a temperature of about -30°C or lower and thus be outside the claimed range.


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TABLE 1


		Comparative Oil A	Comparative Oil B	Berlowitz Data
<b>Laboratory Tests</b>				
KV @100°C (cS)	D445-3	5.514	5.514	5.51
KV @40°C (cS)	D445-3	26.82	27.06	27.12
Density @ 60F (15.5°C)	Calculated	0.8296	0.8259	0.8277
CCS @ -20°C	D5293-4	780	780	710
CCS @ -25°C	D5293-5			
CCS @ -30°C	D5293-6	2220	2800	
CCS @ -35°C	D5293-7	3940	6880	
VI		148.7	146.6	145.6
<b>Density Extrapolations (Calculated)</b>				
Density @ -20 °C, g/ml		0.8521	0.8485	0.8503
Density @ -25 °C, g/ml		0.8564	0.8517	0.8536
Density @ -30 °C, g/ml		0.8686	0.8549	0.8568
Density @ -35 °C, g/ml		0.8618	0.8582	0.8600
<b>Walther Equation Extrapolations (Calculated)</b>				
Kinematic Vis. @ -20 °C, cST		925.6	961.5	975.5
Kinematic Vis. @ -25 °C, cST		1495.3	1560.7	1595.5
Kinematic Vis. @ -30 °C, cST		2525.2	2649.8	2699.6
Kinematic Vis. @ -35 °C, cST		4481.1	4730.6	4831.6
<b>Conversion to Absolute Viscosity</b>				
Viscosity @ -20 °C, cP		788.7	815.8	829.5
Viscosity @ -25 °C, cP		1279.0	1329.3	
Viscosity @ -30 °C, cP		2168.1	2265.4	
Viscosity @ -35 °C, cP		3861.8	4059.8	
<b>CCS Ratios Property</b>				
CCS Ratio @ -20 °C		0.99	0.96	0.86
CCS Ratio @ -25 °C				
CCS Ratio @ -30 °C		1.02	1.24	
CCS Ratio @ -35 °C		1.02	1.39	
<b>Processing</b>				
		Cal Dewaxing	Solvent Dewaxing	Solvent Dewaxing

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12. The prior art does not disclose the importance of hydrodewaxing with a dewaxing catalyst in combination with the other steps to produce a lubricating oil with the claimed properties.
13. Berlowitz does not disclose a lubricant with the claimed properties, either explicitly or inherently, or the ability to produce such a lubricant.
14. Furthermore, Berlowitz and the other cited references are not an enabling disclosure of the invention since a person skilled in the art would not know how to produce a lubricant with the claimed properties without the benefit of Applicant's disclosure.
15. I have read the application and office action rejection and believe applicants are entitled to a U.S. Patent.

  
Eugenio Sanchez

Sworn to and subscribed before me this 30<sup>th</sup> day of March, 2007.

  
(Signature of Notary)

(Seal of Notary)

NANCY E. ESSLINGER  
NOTARY PUBLIC OF NEW JERSEY  
My Commission Expires Oct. 30, 2007

